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The Echinoderms Newsletter<sup>1</sup>

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With this issue we include the good news that the Third Echinoderms Conference is to be held in March, 1978. Those of you who are interested in participating are urged to complete and send to Frank Rowe the enclosed pre-registration form without delay.

Regional Editors, we eagerly await your contributions; please send us what you have, and we'll circulate it promptly.

I think that for the first time ever we have produced two Newsletters within the span of a year. This astounding feat would not have been possible at all without the monumental labors of Cynthia Gust who, becoming impatient with our well developed procrastination techniques, set to and typed virtually all of the Newsletter, duplicated it, addressed the envelopes, and did a million other things. We owe her a great vote of thanks.

David L. Pawson  
Maureen E. Downey

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<sup>1</sup>The Echinoderms Newsletter is not intended to be part of the scientific literature, and should not be cited, abstracted, or reprinted as a published document.

### HELP!! - ADDRESSES UNKNOWN

If you happen to know the addresses of any of the following people, please let us know. Thank you.

J. Campbell	Landenberger
Judith Eastwood	Paul Leviten
Finn Edvardsen	Karl Mauzey
Losza Endelman	R.G. McKellar
Carol Mosher Fernandez	B.F. McPherson
Olga Grageda	Richard Merrill
Spencer Hamada	A.T. Mu
J.R. Harger	P.B. Noble
Ira Jones	B.S. Vasu
Michael Kyte	Kathleen Woolley

### REGIONAL EDITORS

At any time, we are ready to receive reports from the numerous Regional Editors that were listed in the last Newsletter. Please send us any information you have, and we'll include it in Newsletter No. 9. Thank you.

#### Additions to Regional Editors:

Sigmund Kardas - Spain and Canary Islands.  
Jorge A. Petersen - Brazil (

"Recent Publications" list : We are thinking of making the "Recent Publications" list more useful by adding a brief abstract for each title (where appropriate). In order to provide this service we would have to depend upon you to provide us with reprints or, in the case of papers in press, a very brief summary of the paper. We think that the list of titles would be much more useful than it is now if abstracts were to be included.

James Hall Paleontological Society: Interested persons are invited to join the James Hall Paleontological Society of New York State, a non-profit organization being founded by collectors of New York State fossils to further science and to share experiences. Please contact F.H.C. Hotchkiss for further information.

Reviews of books and papers: Several correspondents have suggested that the Newsletter might include reviews of books and important papers, especially those published in obscure journals. We'll do it, provided reviews are not libelous.

Information on collections of echinoderms: E. Tortonese has suggested that we might collect information on systematic collections of echinoderms (size, availability, types, etc). Certainly, it would be good to know where all existing type-specimens of echinoderms are currently being held around the world. Along these lines, what kinds of information on collections would you like to have available? Please write to us with your suggestions, and we will try to get something started. At the very least, for example, it would be good to have a list of the published catalogues of type-specimens of echinoderms.

## Theses and Dissertations

Addendum to the lists of Ph. D. Dissertations and Masters' Theses concerning echinoderms. Previous lists published in the Newsletter: no. 3 (April 1971); No. 4 (December 1972); No. 6 (April 1975); No. 7 (July 1976).

### Ph.D. Dissertations:

Carney, R.S. 1976. The patterns of abundance and relative abundance of benthic holothurians (Echinodermata: Holothurioidea) on Cascadia Basin and Tufts Abyssal Plain in the Northeast Pacific Ocean. Oregon State Univ.

Ellington, W.R. 1976. Metabolic compensation of the sea cucumber Sclerodactyla briareus to reduced oxygen tensions. University of Rhode Island.

Gorzula, S. 1976. Biology of Ophiocomina nigra in the Clyde. (Univ. of London).

Himmelman, J.H. 1976. Factors regulating the reproductive cycles of some west coast invertebrates. (Deals, in part, with Strongylocentrotus purpuratus and S. droebachiensis). Univ. of British Columbia.

Tommasi, L.R. 1968. Echinoderms of the Ilha Grande region (State of Rio de Janeiro). University of S. Paulo.

Wagner, C.D. 1970. Evolution among some Clypeasteroid echinoids. Univ. of California, Berkeley.

Wilke, I. 1976. Autonomy and properties of connective tissue in Ophiocomina nigra. University of Glasgow.

### Masters' Theses:

Ausich, W.I. 1976. The functional morphology and evolution of Risocrinus (Crinoidea: Silurian). Indiana University, Bloomington.

Gras, H. 1976. Physiological and pharmacological studies on the motility of isolated pigment cells in Centrostephanus. University of Cologne.

Lewis, R.L. 1974. Studies in the inadunate crinoid family Pirasocrinidae. The University of Iowa.

Moreno, E.F. 1976. Estudio descriptivo y de distribucion de los asteroideos de la Islas Canarias. Universidad de La Laguna (Tenerife), Canary Islands, Spain.

Precious, M. 1976. Studies on the Biology of the sea urchin, Paracentrotus lividus (Lamarck) in Bantry Bay, Southwest Ireland. University College.

Wagner, C.D. 1963. Revision of the echinoid family Mellitidae. U. of Calif.

### Suggestions and Requests

Boolbootian- presently preparing volume on echinoderms. Need excellent 35mm or larger and/or B&W photos of wide variety of echinoderms, global in nature - USA in specific.

Brito- Would like to exchange papers about Brazilian echinoderms (Recent and fossil) with papers covering the Caribbean Miocene echinoid fauna (Cuba, Puerto Rico, Panama, etc.) and West Africa Cretaceous echinoids.

Clark, A.M., M.E. Downey, and M.Sibuet- are preparing a monograph of the Atlantic Asteroidea. They would appreciate receiving any unpublished records of Atlantic asteroids.

Clark, J.F.- interested in echinoderms from southernmost islands of Pacific, particularly small or incidental collections not reported in literature.

Downey- would like to examine specimens of Peltaster, Sphaerodiscus, and Tosia from the Atlantic, and doubtful specimens of Asterias rubens, vulgaris, and forbesi.

Ellington- requests information regarding "local degeneration" in holothurians. Particularly interested in the distribution of this phenomenon within the group.

Hess- would like to exchange crinoids from Swiss Jurassic (Pentacrinites, extremely well preserved, with tegmen etc.) for specimen of Gilbertsocrinus tuberosus (Crawfordsville) with crown.

Hotchkiss- would appreciate references for bibliography of Paleozoic Asterozoa; Mesozoic and Tertiary echinoids from Antarctica-southern South America region; Paleozoic ophiuroids and somasteroids; abnormal starfish in preservative for dissection.

Kelly, P.- would appreciate information on feeding and reproductive behaviors of abyssal echinoderms; also information on nutrient cycling or energy flow within deep sea with implications from macro-invertebrates; also, parasites of echinoderms.

McConnaughey- pictures (both color and black and white) needed for possible inclusion in Introduction to Marine Biology (3<sup>rd</sup> edition).

Moraes- exchange of information on echinoderms of polluted areas.

Moreno, E.- reprints and works in general are needed related to the morphology, distribution and ecology of the echinoderms of the West Atlantic.

- Paul- information on food and feeding habits of Recent crinoids; feeding, assimilation and respiration rates in any living echinoderms; data on concentrations of crinoid food particles in present day sea water.
- Phelan- wet specimen of Heliophora orbiculus (Linnaeus) needed for study of lateral water vessel distribution.
- Precious- would appreciate any information on newly metamorphosed juvenile echinoids in natural populations, especially: densities, situation in relation to adults of same species, feeding habits and growth rates for comparison with data I have on Paracentrotus lividus.
- Sastry- would like to receive West Pacific representatives of Laganum and Peronella, for exchange of Indian representatives or as donation. (Clypeasteroidea- Laganidae).
- Sibuet- coordinates (geographic and depth) of Atlantic stations deeper than 200 meters where asteroids have been collected and not been published.
- Siegel- would appreciate any unpublished information or current reprints dealing with ecology and reproduction in holothurians; would welcome well preserved specimens of any synaptid or chiridotid holothurians, particularly Chiridota laevis. Will reimburse correspondents for all mailing costs.
- Seibertz- would welcome exchange of information and ideas in biometrical and statistical investigations on recent and fossil echinoids; also interested in information on migration of echinoids (notes and literature); seeks more or less well preserved fossil and recent echinoids (also exchange) for a systematic collection.
- Serafy and F.J. Fell- would like the locality and depth of any North Atlantic echinoids collected from outside their known bathymetric or geographic ranges for zoogeographic study.
- Strathmann- has anyone observed Strongylocentrotus droebachiensis and S. pallidus (equals S. echinoides) spawning in the same place at the same time? Has anyone observed spawning aggregations separating these species?
- Sutton- any information available on parasitism or commensalism of bivalves on ophiuroids.
- Thandar- would like to receive from colleagues a list of all papers on holothurian systematics published since 1970 and reprint articles if available.
- Tortonese- specimens of Echinaster wanted (Whatever species or locality: E. sepositus excepted).
- Wolfe- would like records or known current research with Gorgonocephalidae, especially Astrophyton and other Atlantic species.



## Current Research Projects

- Abbott, D.P.- Studies of diet and behavior of west Indian echinoids.
- Arnaud- Pelecypods associated with antarctic and subantarctic echinoids; ecology and adaptations in benthic invertebrates of the Southern ocean.
- Ausich- Pisocrinus from Nevada and Gaspe; Allens Creek Bank, Analysis of Mississippian Filter-feeding Communities (Borden Group, Indiana); Growth of the Crinoid proxistele.
- Bakus- Benthic biota in the Gulf of Alaska and the Bering Sea.
- Beaver- Blastoids.
- Binyon- Mineral metabolism in asteroids.
- Boolootian- Echinoid Hemal: Physiology. A 16mm Motion Picture Study- 15 minute color. Available in March 1977.
- Breimer- Phylogeny of spiraculate blastoids; speciation in Pentremites, a Mississippian blastoid; revision of Coronate Blastoida.
- Brito- Cretaceous and Tertiary echinoids from Brazil.
- Broom- Behaviour of ophiuroids and crinoids.
- Brower- Evolution of the Melocrinitidae; evolution of Calceocrinidae; Calceocrinids from the Bromide Limestone (Middle Ordovician); Middle Ordovician crinoids from the Twin Cities in Minnesota.
- Brunel- Seasonal succession and daily activity rhythms of circalittoral hyperbenthic Crustacea in the Gulf and estuary of the St. Lawrence; distribution of the epibenthic invertebrate macrofauna of the Gulf and estuary of the St. Lawrence; distribution of endo- and hyperbenthic invertebrate communities in the Gulf and estuary of the St. Lawrence.
- Burke, R.B.- The development and functional morphology of the echinopluteus larva.
- Campbell- Analysis of basi-epithelial nervous system of echinoids with reference to spine and pedicellaria control; structure of deep-sea echinoid pedicellaria.
- Challis- Systematics and paleoecology of Tertiary echinoids, molluscs, and microfossils from the Maltese Islands.
- Cherbonnier- Holothurians of Madagascar.

Clark, J.F.- Rebuilding and outfitting a forty foot ketch for echinoderm collecting circumnavigation to commence spring of 1978.

Crippen- Marine benthic and intertidal studies in the Arctic and Maritimes; environmental impact studies in the above regions.

Dan, K.- Mechanism of unequal cleavage.

Dartnall- Biogeography of shallow water, marine benthos off eastern Tasmania.

Dayton- Benthic ecology in California and Antarctica.

Dehm- Devonian echinoids.

Downey- Atlantic asteroid monograph with A.M. Clark and M. Sibuet; juvenile asteroids and larval development and metamorphoses of asteroids.

Durham- Polymorphism in the Pliocene sand-dollar Merriamaster (Echinoidea); new Merriamaster and Dendraster from Purisima Formation, California (with Scott R. Morgan); Clypeaster biarritzensis Cotteau from Lower Oligocene of Iran (with Fathollah Mojab); a new Gogia from Early Cambrian of California.

Ellington- Purification and characterization of the L-lactate dehydrogenase (EC 1.1.1. 28) from the longitudinal muscle of Stichopus parvimensis.

Geary- Oogenesis in the Pacific sand-dollar Dendraster excentricus, with special reference to the morphogenesis of the red pigment cell in the egg jelly.

Hansen- Systematics and biology of deep-sea holothurians.

Harrold- Feeding strategies of five species of starfish in the kelp forest adjacent to Hopkins Marine Station in Pacific Grove, California.

Hawkins- Ecological energetics of Diadema antillarum on a fringing coral reef in Barbados, W.I.

Henderson- Cenozoic Australasian clypeasteroid echinoids of the family Arachnoididae; Late Cambrian echinoids from western Queensland, Australia.

Hess- Redescription of Pentaceros jurassicus Zittel (Lower Tithonian of Bavaria).

Hill- Cloacal rhythmicity, longitudinal retractor physiology and local degeneration in holothurians.

Hiramoto- Cell division and cell movement.



- Hotchkiss- Paleozoic ophiuroids and asteroids; Mesozoic and Tertiary echinoids of Antarctica and southern South America; homologies between echinoderm classes; orientation and symmetry of echinoderms; abnormalities, regeneration and growth gradients in starfish and ophiuroids; echinoderm larvae and phylogenetic trees; Belize ophiuroids; Indian Ocean starfish.
- Iwata- Reproductive physiology in echinoids.
- Jefferies- Detailed study of Peltocystid mitrates (Stylophora) in the hope that this will throw light on the origin of the tunicates, (with David Lewis).
- Kanatani- Mechanism of oocyte maturation and fertilization in starfish.
- Kelly, P.- Ecology of reproductive and feeding behaviour of the deep-sea asteroid, Dytaster insignis.
- Kier- Distribution of regular and irregular echinoids through geologic time with emphasis on the poor fossil record of regular echinoids; index of the fossil and living species of echinoids described since 1924, and the bringing up-to-date of Lambert and Thiery (with Mary H. Lawson); some new Ordovician echinoids from U.S.
- Kobayashi- Marine Pollution bioassay by sea urchin eggs.
- Lucas- Biology of Acanthaster, including larvae, saponins, isoenzymes, hybrids, growth and reproduction.
- McConnaughey- Analysis of fielding sampling data to bring out biotic communities and associations.
- MacFarland- Designing administration and management plan for marine park in Galapagos Islands.
- Mackie, A.M.- Experiments on sea-stars terminated for the moment.
- Macnab, J.A.- Distribution of Dendraster excentricus on the Pacific coast of North America.
- Marsh- Taxonomy and zoogeography of Western Australian Asteroids; Asteroids of Palau (Caroline Ids.).
- Menge, B.- Analysis of community structure and stability in temperate (New England, Pacific Northwest), and tropical Panama rocky intertidal regions.
- Messing- Recent crinoid communities in the Straits of Florida; revisions of Atlantic species and genera of comatulids (e.g., Pentametrocrinus, Atelecrinus, Caryometra, Trichometra); tanaid crustaceans.
- Millendorf- Ontogeny, functional morphology, and redescription of the Middle Devonian blastoid Eleutherocrinus.

- Mitrovic- Problems of echinoderm terminology and nomenclature.
- Moreno- Echinoderms of Macronesia.
- Morrill- Morphogenetic and biochemical effects of glucosamine analogs on the development of Lytechinus; echinoid gametes, embryos and larvae as bioassay systems for pollutants and development of water quality indices.
- Paine- Role of asteroids and echinoids in structuring intertidal communities.
- Patent- Electron microscopy of ophiuroid gonads; relationship of Gersemia to Gorgonocephalus.
- Paul, C.- Computer simulation of respiration and feeding in Paleozoic echinoderms, British Ordovician cystoids, Scandanavian Ordovician echinoderms; evolution of Sphaeronites.
- Pawson- Revision of the Holothurian family Myriotrochidae.
- Pentreath- Morphology of echinoderm nervous systems.
- Phelan- The numerical increase of lateral water vessels and accessory tube feet with plate growth in Dendraster excentricus.
- Philip, G.- Southeast Australian Tertiary echinoids.
- Precious- Field and laboratory studies on newly metamorphosed juvenile Paracentrotus lividus (Lamarck) with special reference to settlement requirements and subsequent growth rates.
- Prokop- The family Hexacrinitidae/ Wachsmuth and Springer, 1881/, Bassler 1938 from the Silurian and Devonian of Bohemia/ Crinoidea.
- Rasmussen- Mesozoic and Cainozoic crinoids.
- Roux- Crinoids, ontogeny and evolution of peduncles of the fossil and recent Articulata; microstructure of the articulations of the peduncles.
- Rutherford- Population biology of tropical holothurians.
- Rutman- Reproduction of Red Sea Crinoids.
- Sato- Immuno-fluorescence, Anti-tubulin staining of mitotic spindle; fine structure analysis of mitotic spindle in living, dividing cells.
- Scally- Structure and function of regular echinoid teeth.
- Seibertz- Biometrical investigations in fossil echinoids (Echinocorys, Turonian); paleobiogeography, distribution and migration of Micraster in Northwest Europe.

- Serafy- Echinoderms of middle Atlantic outer continental shelf (New Jersey to Virginia); animal sediment relationships.
- Sibuet- Monograph of the asteroids of the Atlantic (with A.M. Clark and M. Downey); vertical distribution of Atlantic abyssal asteroids; a study of the intestinal contents of certain abyssal holothurians.
- Siegel- Ecology and reproductive biology of Chiridota laevis; ecology and behavior of northern New England holothurians.
- Smith, A.B.- Microstructure of the echinoid test; functional morphology of recent and fossil echinoid tubercles and pore pairs; palaeoecology of the echinoid fauna of the Cotswolds, England.
- Speel- Intertidal distribution of brachiopods and priapulids in Maine; statistical analysis morphological variation in Antarctic crinoids.
- Sprinkle- Echinoderm faunas from the Bromide Formation (Middle Ordovician) of Oklahoma (with 8 other authors); Late Cambrian echinoderms from S.E. Missouri (with Strimple); new Middle Cambrian edriasteroid from Nevada (with Bell); Early Pennsylvanian blastoids from Oklahoma and Arkansas (with Katz).
- Strathmann- Adaptive aspects of complex life cycles and variations in egg size; hybridization and interspecific competition in the echinoids Strongylocentrotus droebachiensis and S. pallidus; limitations of ciliary feeding mechanisms in larvae.
- Sutton- Systematics of Amphiuridae (Ophiuroidea) from west coast of North America; population biology of Amphiodia urtica; reproductive biology of Amphiodia occidentalis; ophiuroid-mollusc and ophiuroid-crustacean symbiotic and parasitic relationships; re-organization of California Academy of Sciences ophiuroid collection; development of comprehensive reference collection, bibliography, repository, and identification manuals for San Francisco Bay-Delta System and environs.
- Takahashi- Physiology of echinoderm muscles and connective tissue; motility of echinoderm spermatozoa.
- Termier- Skeleton texture of some Echinodermata.
- Thandar- The holothurian fauna of South Africa (excluding shallow water species from Natal).
- Tommasi- Ophiuroids from Antarctica and subantarctic regions of the family Ophiuroidea (USARP); ophiuroids from southwest Atlantic region of the family Amphiuridae (with Maria Natividade de Albuquerque); echinoderms from polluted estuarine regions of São Paulo coast (with Tânia Maria Camargo de Moraes).
- Tortonese- Revision of Holothuroidea in the Italian fauna; the genus Echinaster (with M. Downey).

Wagner, C.- Evolution and distribution of North Pacific recent and fossil Clypeasteroid echinoids.

Walker, C.- Gametogenesis and ultrastructure of the spermatogenic columns in Asterias vulgaris.

Weber- Physiology and ultrastructure of light-sensitive pigment cells in Centrostephanus longispinus; ultrastructure of the nervous system in Centrostephanus longispinus.

Wolfe, T.J.- Growth and feeding behavior of the basketstar, Astrophyton muricatum; literature review of the Gorgonocephalidae.

Word- Taxonomic standardization Program for the Southern California area; Ophiuroidea systematics and ecology.

Wright, M.B.- Taxonomy and ecology of Eastern Pacific holothurians.

ALSO:

Broadhead - Systematics and evolution of the Dichocrininae; mechanics of the anisotrophic crinoid column, Platyplateium (with Strimple).

Lewis - Depositional environments and paleoecology of the Oil Creek Formation (Ordovician) of Oklahoma.

Strimple - Regeneration in Pennsylvanian crinoids (with Lewis); Gasperian crinoids of Virginia and Tennessee (with Coney); Pennsylvanian-Permian crinoids of Utah (with Miller); eleutherozoic Paragassizocrinus (with Ettensohn).

Witzke - Echinoderms of the Hopkinton Dolomite (Late Llandoveryan).

## Recent Publications and Papers in Press

This list is based upon Newsletter replies plus reprints received. Please note that many of the papers listed below as "in press" will already have been published.

Arnaud, P.M., 1975. Bottom life under Antarctic ice shelves. *Nature*, 256 (5517) : 521.

\_\_\_\_\_, in press. Adaptations within the Antarctic benthic ecosystem. Third Symposium on Antarctic Biology, Washington.

\_\_\_\_\_ and F. Arnaud, A. Intes, and P. Le Loeuff, in press. Transport d'invertébrés benthiques entre l'Afrique du Sud et Sainte Hélène par les Laminaires (Phaeophycées). *Bull. Mus. Hist. nat., Paris*, (Ser. Ecologie).

Ausich, W.I., in press. The functional morphology and evolution of Pisocrinus (Crinoidea: Silurian). *J. Paleont.*

Baker, A.N., 1975. Fishes: Marlins and Swordfish. *New Zealand's Nature Heritage*, Vol. 7, Part 96: 2686-2692.

\_\_\_\_\_ and H.E.S. Clark, 1975. Brittle Stars and Starfishes. *New Zealand's Nature Heritage*, Vol. 5, Part 64: 1783-1789.

\_\_\_\_\_ and L.M. Marsh, 1976. The rediscovery of Halityle regularis Fisher (Echinodermata: Asteroidea). *Rec. West. Aust. Mus.*, 4 (2): 107-116.

\_\_\_\_\_ and J. Yaldwyn, 1976. Islands, Oceans and Marine Life Patterns. *Australian Natural History*, 18 (10): 376-380.

Bakus, G., in press. An Oceanographic and Marine Biological Study in the Gulf of Alaska. *Proc. Symp. Science, Resources and Technology in the Gulf of Alaska*. Arctic Instit. 62 pages. N. America - Mar. Sci. Instit., U. of Alaska.

\_\_\_\_\_, in press. Role of the Benthos in the Gulf of Alaska Ecosystem. 32 pages. *Proc. Symp. Science, Resources, and Technology in the Gulf of Alaska*. Arctic Instit.

Bell, B.M., H.L. Strimple and C.O. Leverson, 1976. Edrioasteroids (Echinodermata) of the Maquoketa Formation of Iowa. *Proc. Iowa Acad. Sci.* 83: 23-27.

\_\_\_\_\_, Morris S. Peterson, 1976. An Edrioasteroid from the Guilmette Formation at Wendover, Utah-Nevada. *J. Paleont.* 50(4): 577-589.

Bernasconi, I., in press. Ofiuroides del Mar Epicontinental Argentino (en colaboración con M.M. D'Agostino).



- Binyon, J., 1976. The Permeability of the asteroid podial wall to water and potassium ions. J. mar. biol. Ass. U.K. 56: 639-647.
- Breimer, A., in press. Chapters on 'General Morphology of Recent Crinoidea' and 'General Ecology and Paleoecology of Fossil Crinoidea', in: R.C. Moore and C. Teichert (Eds.), Treatise on Invertebrate Paleontology, Part T,
- Broadhead, T.W., 1976. Depositional systems and marine benthic communities in the Floyd Shale, Upper Mississippian, Northwest Georgia, in R.W. Scott and R.R. West (eds.) Structure and Classification of paleocommunities, Dowder, Hutchinson and Ross, p. 263-278.
- \_\_\_\_\_, in press. Systematics and distribution of the Callocystitidae (Echinodermata, Rhombifera). J. Paleont.
- \_\_\_\_\_ and H.L. Strimple, in press. Permian platycrinitid crinoids from Arctic North America. Canadian Jour. Earth Sci.
- Brower, J.C., and J. Veinus, 1975a. "Ontogeny of Hybocrinus punctatus (Miller and Gurley), and Ordovician crinoid". Journal of the International Association of Mathematical Geology 7 (2): 129-147.
- \_\_\_\_\_, 1975b. "Evolution of the Melocrinitidae", (Abstract), Geological Society of America, abstract vol. for northeastern section, p. 31.
- \_\_\_\_\_, 1975c. "Silurian crinoids from the Pentland Hills, Scotland". Palaeontology, vol. 18, pt. 3: 635-656.
- \_\_\_\_\_, 1976a. "Promelocrinus from the Wenlock at Dudley". Paleontology, vol. 19, 651-679.
- \_\_\_\_\_, in press. "Growth of camerate crinoids, a summary", Treatise on Invertebrate Paleontology, Pt. 1, Echinodermata 2 (Crinoidea), R.C. Moore (ed.), Geological Society of America and University of Kansas Press.
- \_\_\_\_\_, in press. Evolution of the Melocrinitidae. Proc. Vol. for Second Conference on Echinoderms, Thalassia Jugoslavica.
- \_\_\_\_\_, in press. Calceocrinids from the Bromide Formation (Ordovician) of Oklahoma. Circular, Oklahoma Geological Survey.
- Bouchet, P. and J. Lutzen, 1976. Pisolamia, nouveau genre de Gasteropode, parasite de l'holothurie abyssale Oneirophanta mutabilis. C. R. hebdomadaire Seances Acad. Sci., Paris, 282: 1013-1016.
- Campbell, A., 1976. Observations on the activity of echinoid pedicellaria III. Jaw responses of globiferous pedicellaria and their significance. Mar. Behav. Physiol. 4: 25-39.
- \_\_\_\_\_, 1976. Hamlyn Guide to the Seashore and Shallow seas of Britain and Europe. 320 pp. Paul Hamlyn; London.



- Campbell, A. and P.S. Rainbow, in press. The role of pedicellaria in preventing settlement on the sea urchin test.
- Carroll, E.J. and D. Epel, 1975. Elevation and hardening of the fertilization membrane in sea urchin eggs: Role of the soluble fertilization product. *Expt. Cell Res.* 90: 429.
- \_\_\_\_\_, and D. Epel, 1975. Isolation and biological activity of the proteases released by sea urchin eggs following fertilization. *Develop. Biol.* 44: 22.
- \_\_\_\_\_, 1976. Cortical granule proteases from sea urchin eggs. *Methods in Enzymology*.
- \_\_\_\_\_, R.C. Fahey, D. Epel, G.P. Maier, and S.D. Mikolajczyk, 1976. Changes in the glutathione thiol-disulfide status in sea urchin eggs and early embryos. *Biochem. Biophys. Acta.* 437: 445.
- \_\_\_\_\_, 1973. The block against polyspermy: Studies on the protease released by sea urchin eggs following fertilization. *J. Cell Biol.* 59: 47a.
- \_\_\_\_\_, 1973. Further studies on the protease released by sea urchin eggs following fertilization. *Amer. Zool.* 13: 1315.
- \_\_\_\_\_, 1974. Characterization and functions of sea urchin cortical granule proteases in fertilization. *J. Cell Biol.* 63: 51a.
- \_\_\_\_\_, 1974. On the mechanism of fertilization membrane elevation in the sea urchin. *Amer. Zool.* 14: 1251.
- \_\_\_\_\_, 1975. Nicotine induces polyspermy in sea urchin eggs by inhibiting the cortical granule protease. *Amer. Zool.* 15: 780.
- \_\_\_\_\_, J.D. Johnson, and H.W. Byrd Jr., 1975. A novel method for the complete removal of the vitelline layer of sea urchin eggs. *Amer. Zool.* 15: 780.
- \_\_\_\_\_, and H. Levitan, 1976. Fertilization of sea urchin eggs is blocked by fluorescein dyes. *J. Cell Biol.* 70: 96a.
- Caso, Maria E., 1974. Contribución al Estudio de los Equinoideos de México el Género Tripneustes Agassiz. *Morfología y Ecología de Tripneustes ventricosus (Lamarck)*. *An. Centro. Cienc. Del Mar y Limnol., Univ. Nal. Autón. México*, 1 (1): 1-24.
- \_\_\_\_\_, 1974. Contribución al Estudio de Los Equinoideos de México, *Morfología de Tripneustes depressus Agassiz y Estudio Comparativo entre T. ventricosus y T. depressus*. *An. Centro. Cienc. Del Mar y Limnol., Univ. Nal. Autón. Mexico*, 1 (10): 25-40.

- Cayer, M.L., T. Kishimoto, and H. Kanatani, 1975. Formation of the fertilization membrane by insemination of immature starfish oocytes pretreated with calcium-free seawater. *Development, Growth and Differentiation*. 17: 119-125.
- Cherbonnier, G., 1974. Redescription de l'Holothurie Aspidochirote Holothuria (Thymiosycia) truncata Lampert. *Bull. Mus. Natn. Hist. nat., Paris, 3<sup>e</sup> Série*, no. 253, *Zoologie* 175: 1439-1443.
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